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REVIEWS

Gardner's Cytological Studies in Cyanophyceae *

The many difficult questions as to the minute structure of the blue-green algae have been thoroughly reviewed and carefully studied by Dr. Gardner and his results are clearly set forth in a paper which appeared last November in the University of California Publications. His investigations have been concerned chiefly with fifty-three species representing many genera and most of the families of the Cyanophyceae. With this broad view of the field, there is naturally a better opportunity of reaching just conclusions than in the more common cytological method of studying only a few forms. Dr. Gardner found that with proper treatment everything of essential importance in the cells of these small plants may be seen without making microtome sections and finally came to use the microtome "only to supplement and check results obtained without it." The principal points as to which there has been disagreement among observers involved the existence of nucleus and chromatophores, the structure of the cytoplasm, the structure of the nucleus, if it exists, and its behavior during cell-division. Some of the more interesting results of the present investigation are summarized by Dr. Gardner as follows :

"The cell of the Cyanophyceae contains a nucleus which in some species is sharply delimited from the surrounding cytoplasm, while in others the differentiation is much less marked."

"In all the species studied, with the possible exception of *Synechocystis*, the nucleus divides amitotically, beginning at the periphery and gradually proceeding to the center."

"There is no definitely organized chromatophore, the cytoplasm holding the coloring matters."

"No protoplasmic continuity between the vegetative cells has been demonstrated."

"A new type of nuclear division has been discovered in *Dermocarpa*, in which the nucleus breaks up simultaneously into a large number of daughter nuclei by a process of amitosis."

* Gardner, Nathaniel Lyon. Cytological Studies in Cyanophyceae. University of California Publications. Botany 2 : 237-296. pl. 21-26. 10 N 1906.

"The present investigation reveals in the Cyanophyceae a series of nuclear structures beginning with a very simple form of nucleus scarcely differentiated from the surrounding cytoplasm and dividing by simple direct division. From this we pass by very gradual steps to a highly differentiated form of nucleus which in dividing shows a primitive type of mitosis, and in structure approximates the nucleus of the Chlorophyceae and the higher plants."

"In this group of plants the transmission of hereditary qualities seems to be accomplished with the greatest precision, without the complicated machinery of mitosis. In this connection it may be noted that the lack of sexuality seems in no wise to affect the amount of variation, which is quite the same as in groups where sexual reproduction occurs."

MARSHALL A. HOWE.

PROCEEDINGS OF THE CLUB

MARCH 27, 1907

The Club met at the museum building of the New York Botanical Garden at 3:30 P. M. Thirteen persons were present.

The death of Dr. Otto Kuntze, at San Remo, Italy, on January 28, 1907, was reported, and the resignation of Professor George Macloskie was presented and accepted.

The following scientific program was presented:

"Some Lactarii of Windham County, Vermont," by Miss Gertrude S. Burlingham:

The rugged and wooded character of Vermont makes the region especially favorable for the growth of the fleshy fungi. But the only field work in the state on this group, of which we have published results, is that of Charles C. Frost (1805-1880), who collected in the vicinity of Brattleboro. Frost was a shoemaker in Brattleboro, and is commonly reported to have begun his botanical tramps as an antidote for dyspepsia. In 1875 he coöperated with Tuckerman in a "Catalogue of plants growing without cultivation within thirty miles of Amherst College," and it is probable that most of the fungi listed were collected by Frost in Vermont.